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ABSTRACT

A study that examined the relationship between Illinois schools' expenditure per pupil and students' state assessment exam scores is described in this paper. The Illinois reading and mathematics tests were administered to students in grades 3, 6, 8, and 11, and language arts exams were given to students in grades 3, 6, and 8. The number of participating schools ranged from 655 schools for 11th-grade students to 2,347 schools for the 3rd-grade students. A Pearson r correlation was calculated to determine if there was any significant relationship between school spending, defined as "operating expenditures per pupil for 1989-90," and the student achievement scores for April 1991. Findings indicate that the mean expenditure per pupil was $4,424. A small but statistically significant, negative correlation existed between spending and achievement in every subject in every grade level, with the exception of grade 11, where there was no significant correlation between the variables. An implication is that giving schools more money does not necessarily raise student achievement, probably because the majority of school funds are used for personnel costs. It is suggested that schools may need to target specific programs with any increase in school funding rather than have the funds spread throughout the school. Four tables are included. (Author/LMI)

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School Spending:

Is There a Relationship Between Spending and Student Achievement?

A Correlation Study of Illinois Schools

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Presented at the Annual Meeting of the

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Abstract

Because of the interest in the issue of equity in school funding, attention has been placed on school spending and its relationship to fairness and adequacy and the changes taking place in various states' finance formulas to accomplish these goals. This study dealt with a different relationship, the relationship between school spending and student achievement, and asked the question: Is there a significant relationship between school spending and student achievement? This study examined the relationship between expenditure per pupil in Illinois schools and the scores of students on state assessment examinations. These state tests were administered in the areas of reading and mathematics in grades three, six, eight, and eleven. Language arts examinations were given to students in grades three, six, and eight. The number of schools involved in the study ranged from 655 for the eleventh grade students to 2,347 schools for the third grade students. A Pearson r correlation was calculated to see if there was any significant relationship between school spending, defined as the Operating Expenditures Per Pupil for 1989-90, and the student achievement scores for April, 1991. An alpha level of .05 was selected to test for statistical significance. The data for the per pupil expenditures

and student scores were obtained from the State Department of Education of the State of Illinois. The minimum expenditure found in this study was $ 2, 253 per pupil; the maximum per pupil expenditure was $ 14, 316. The mean was $ 4, 424. Results showed a small, but statistically significant, negative correlation between spending and achievement in every subject in every grade level, with the exception of the eleventh grade, where there was no significant correlation between the variables. An implication from this study might be that simply giving a school more money does not necessarily raise student achievement, probably because the large majority of school funds are used for personnel costs (salaries and benefits). Schools may need to target specific programs with any increase in funding rather than have the funds spread throughout the school.

School Spending:

Is There a Relationship Between Spending and Student Achievement?

A Correlation Study of Illinois Schools

Introduction

Equity in school spending has been a prominent issue in education the past few years. Major court decisions in states like Kentucky, Texas, and New Jersey have challenged state legislatures to restructure their systems of school finance and place additional dollars into whatever system they established. State courts will hear even more cases as challenges to equity and adequacy are being raised in Illinois, Indiana, Ohio, and other states.

The equity issue is based on the concept that a child's quality of education should not be determined by where he/she lives in the state. This issue is not a new one. Cubberly (1906) wrote that "all the children of the state are equally important and are entitled to have the same advantages" (p. 17).

Because of the interest in the equity issue, attention has been placed on school spending and its relationship to fairness and adequacy, and on

the changes necessary in various states' finance formulas to accomplish these goals.

This study deals with a different relationship---the relationship between school spending and student achievement, a step beyond the equity issue. The equity issue, admittedly simplified, states that student X does not receive the same quality of education as student Y because X lives in an area where property taxes cannot produce as much revenue as that produced in student Y's school district. As a result, proponents of change suggest that the state has the responsibility to equalize these differences by various means. In this discussion, "educational quality" is usually defined as the expenditure per pupil in the school district. Thus, the gap in the "educational quality" in these two districts can be reduced, according to those advocating the change, by increasing the funds to the district with the lower per pupil expenditure.

Unfortunately, most proponents of the equity issue stop at the above argument. They do not take it a step further to see what such "equal quality" means. Most would probably go back to Cubberly's concept that each child should have an equal opportunity for school success. The goal of equal opportunity can hardly be debated in this country, but it can hardly be measured either. Some equity proponents may go even further

and state that they want equity in order to enhance student achievement, under the assumption that greater equity yields greater opportunity which produces greater student achievement. In other words, students whose schools receive greater funding should also have better achievement. This is the subject of this study.

The literature on student expenditures and student achievement is conflicting. In a research study involving high school economics students, increased expenditures produced improved student achievement (Lopus, 1990). In another study, researchers analyzed data from 332 school districts in Arkansas and found significant relationships between the relative wealth of the school districts and fourth grade reading scores (Klingele &Warrick, 1990). However, wealth is not synonymous with spending. A study in New York of 1,021 public schools showed that variations in school spending and educational resources do affect average student achievement (Wendling & Cohen, 1981). And, in Virginia, researchers studied 30 districts and found that variable but significant relationships existed between educational funding and pupil achievement in the areas of mathematics, reading, language arts, social studies, and science in the grade levels studied: fourth, eighth, and eleventh (Connors, 1982).

A study aimed at the improvement of low-income school districts in New York showed that while increased district expenditures could produce improved scholastic outcomes, it was estimated that it would take an increase of 67% in per student expense in order to produce a 15% increase in student achievement, making it difficult for the author to justify the budgetary change (Spottheim, et al., 1989). A study of 610 school districts in Ohio found that there was little, if any, correlation between money spent on students and the proficiency tests of ninth-graders (Vedder, 1992). Finally, a meta-analysis of research on the relationship between expenditures and achievement found a minimal relationship between the two variables, except for direct instructional expenditures. The amount spent was found to be less important than how the money was spent (Childs & Shakeshaft, 1986). For example, vocational and special education increase the average costs per pupil and may not relate directly to achievement on standardized tests of reading and mathematics.

Method

This study examined the relationship between expenditure per pupil and student scores in Illinois schools in order to answer the research

question: Is there a significant relationship between the amount of money spent on students and student achievement? Expenditure per pupil was defined to be the Operating Expenditures Per Pupil, 1989-90, as defined by the State of Illinois, for each Illinois school district. In April, 1991, state assessment tests were administered in the areas of reading and mathematics in grades three, six, eight, and eleven. Language arts examinations were given to students in grades three, six, and eight.

A Pearson r correlational analysis was performed to see if there was any significant relationship between per pupil expenditures and student scores. An alpha level of .05 was selected to test for statistical significance. The number of schools participating varied with the examination given: from 655 schools for the eleventh grade exams to 2,347 for the third grade tests. The tables which follow detail the number of schools tested for each exam. The data for the per pupil expenditures and student scores were obtained from the State Department of Education of the State of Illinois, with analysis done at Southern Illinois University at Carbondale.

Results

Table 1 shows that there was a small negative correlation between per pupil expenditures and the reading scores for the third graders who were tested. Similarly, there was a small negative correlation between per pupil expenditures and the mathematics and language arts scores of the third graders.

Insert Table 1 about here

Table 2 shows a negative correlation between per pupil expenditures and the reading, mathematics, and language arts scores of the sixth grade students who were tested.

Insert Table 2 about here

Table 3 shows a negative correlation between per pupil expenditures and the reading, mathematics, and language arts scores of the eighth grade students.

Insert Table 3 about here

Finally, Table 4 shows no significant correlation between per pupil expenditures and the reading and mathematics scores at the eleventh grade level.

Insert Table 4 about here

The minimum expenditure found in this study of Illinois school districts was $2,253 per pupil; the maximum was $14,316; the mean was $4,424.

Discussion

In the schools studied at the third, sixth, and eighth grade levels, there was a negative correlation between the per pupil expenditure and the student scores on the assessment tests given in the areas of reading, mathematics, and language arts. Although the correlation coefficient was small, it was statistically significant at the .0001 level. The eleventh grade testing in mathematics and reading revealed no significant correlation between per pupil expenditure and the scores in these two

areas.

While it would be wrong to state that reducing school spending would increase student achievement (as some might say after seeing these results), it would be equally wrong to make the statement that many people now make--that students would achieve more in schools if schools had more money to spend. The statistics in this study do not support that statement. It is probably true, though not explored in this study, that increased spending in specific areas can improve student achievement in those areas. For example, purchasing lab equipment, videos, and providing additional help to students might improve student achievement in chemistry. Likewise, investing in a language or a computer laboratory would probably improve student achievement in oral language and computer knowledge. However, simply giving a school more money without targeting it to areas which directly affect student achievement will not automatically cause student achievement to increase. Since the large majority of school funds are used for personnel costs (salaries and benefits), adding more funds to a school may simply mean that these salaries and benefits increase, and paying the staff more or increasing their benefits should not affect student achievement to any extent.

Table 1

Correlations Between Per Pupil Expenditures and Illinois Third Grade Student Scores in Reading, Mathematics, and Language Arts

Relationship	Pearson r	Alpha	Significance	N
Correlations Between Per Pupil Expenditures and Third Grade Student Scores in the following areas:				
Reading	-0.24950	0.0001	S	2,347
Mathematics	-0.20607	0.0001	S	2,347
Language Arts	-0.18505	0.0001	S	2,345

Note. "N" represents the number of schools participating in the testing.

Table 2

Correlations Between Per Pupil Expenditures and Illinois Sixth Grade Student Scores in Reading, Mathematics, and Language Arts

Relationship	Pearson r	Alpha	Significance	N
Correlations Between Per Pupil Expenditures and Sixth Grade Student Scores in the following areas:				
Reading	-0.33837	0.0001	S	1,922
Mathematics	-0.24520	0.0001	S	1,922
Language Arts	-0.24911	0.0001	S	1,920

Note. "N" represents the number of schools participating in the testing.

Table 3

Correlations Between Per Pupil Expenditures and Illinois Eighth Grade Student Scores in Reading, Mathematics, and Language Arts

Relationship	Pearson r	Alpha	Significance	N
Correlations Between Per Pupil Expenditures and Eighth Grade Student Scores in the following areas:				
Reading	-0.36169	0.0001	S	1,391
Mathematics	-0.37567	0.0001	S	1,391
Language Arts	-0.28176	0.0001	S	1,389

Note. "N" represents the number of schools participating in the testing.

Table 4

Correlations Between Per Pupil Expenditures and Eleventh Grade Student Scores in Reading and Mathematics

Relationship	Pearson r	Alpha	Significance	N
Correlations Between Per Pupil Expenditures and Eleventh Grade Student Scores in the following areas:				
Reading	0.00511	0.8961	NS	655
Mathematics	0.04405	0.2603	NS	655

Note. "N" represents the number of schools participating in the testing.

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